Shadow

Shadow Overview

Volunteer monitoring began at Shadow Lake in the 1980s and has continued through 2004, with gaps in 1996 and 1999. The data indicate this lake is moderate in primary productivity (mesotrophic) with good water quality.

Shadow Lake has a public access boat launch. Eurasian milfoil has been found in the lake since 1995, but populations appear to be stable. Residents should keep an eye on aquatic plants growing nearshore to catch any increases in patches of this, Brazilian elodea, and other noxious weeds.

Physical Parameters

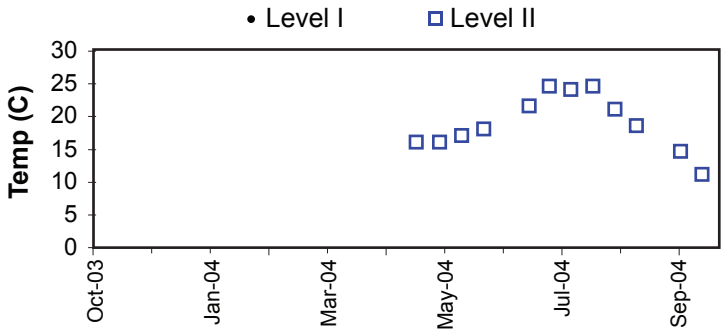
Secchi transparency ranged from 2.5 to 3.4 m from late April through October, averaging 2.9m which placed it in the mid range for small lakes monitored in 2004. Water temperatures reached 24.5 degrees Celsius during the same period, putting in the lower range for the maximum recorded among the group.

Excellent local precipitation and water level records detailed a pattern similar to the winter-high, summer-low stands characteristic of the region. Some sensitivity to large rainfall events was evident, particularly to large storms.

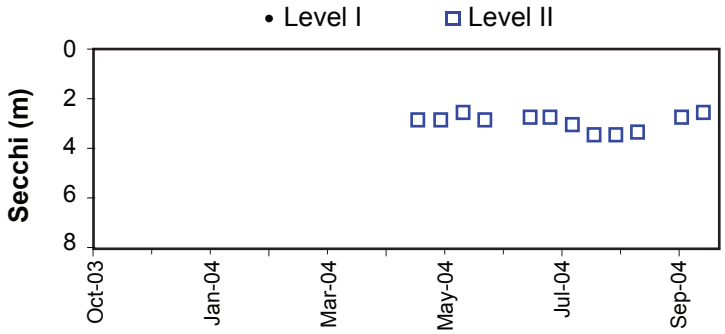
Nutrient Analysis and TSI Ratings

Total nitrogen decreased early in the season and then remained in relatively constant proportion to total phosphorus. The N:P ratio ranged from 30 to 73, averaging 49 which suggested poor conditions for nuisance bluegreen growth through much of the season.

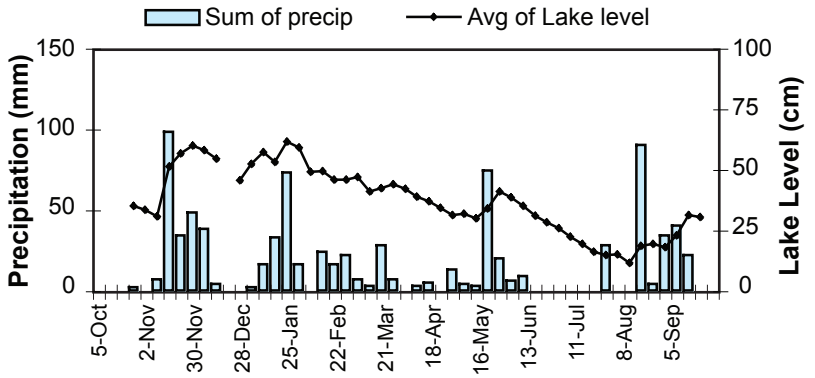
Lake Temperature



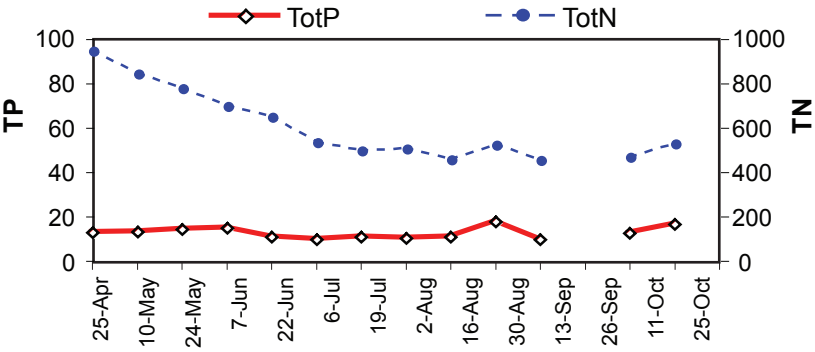
Secchi Depth



Lake Level and Precipitation



Nutrient Analysis



Profile data indicate that thermal stratification was present early in the season and persisted through the summer. Concentrations of phosphorus in the deep water grew slowly, suggesting some accumulation due to sediment release. Chlorophyll data indicated that algae were equally distributed through the shallow depths of the water column.

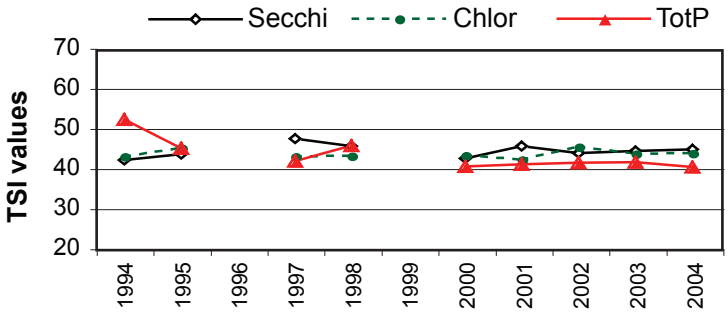
In 2004 the average TSI values were close together in the lower midrange of mesotrophy, similar to recent years.

Chlorophyll Concentrations and Algae

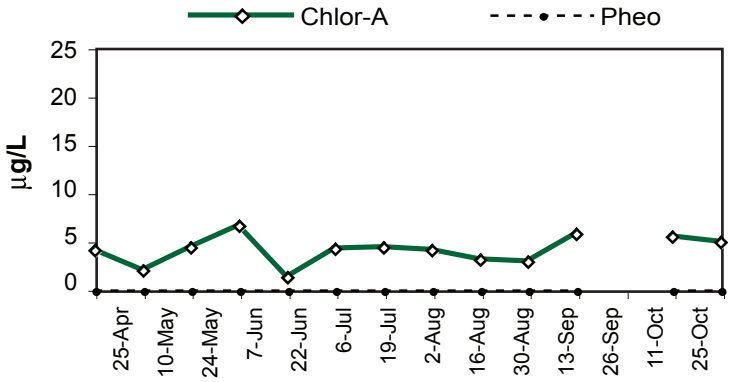
Chlorophyll concentrations remained stable through the season, with no obvious peaks in value. The spring algae were dominated by a combination of the bluegreens *Aphanizomenon flos-aquae* and *Anabaena* as well as *Anacystis*. These were succeeded by several colonial chlorophytes, the chrysophyte *Dinobryon,* and the cryptophyte *Rhodomonas*. *Aphanizomenon* returned in the fall.

Date	Secchi	depth-m	degC	Chlor-A	TP µg/L	TN µg/L
5/24/04	2.5	1	17.0	4.49	14.2	777
		6	6.5	<detect	16.5	1060
		11	5.0		21.2	1070
8/30/04	3.4	1	21.0	3.00	17.8	525
		6	8.0	2.70	14.5	692
		11	5.5		83.7	1020

TSI Ratings



Chlorophyll a Concentrations (ug/L)



Common Algae

	Group
Aphanizomenon flos-aquae	Cyanobacteria
unidentified colony	Chlorophyta
Anabaena sp	Cyanobacteria

Shadow

2004 Level I Data

Daily Data Summary

Week of	Sum of precip. (mm)	# of days	Avg of lake level (cm)	# of days
28-Sep-03				
5-Oct-03				
12-Oct-03				
19-Oct-03				
26-Oct-03	2.0	1	35.0	1
2-Nov-03	0.0	7	33.3	7
9-Nov-03	7.0	7	30.4	7
16-Nov-03	98.0	7	51.0	7
23-Nov-03	34.0	6	56.6	7
30-Nov-03	48.0	5	59.7	7
7-Dec-03	38.0	7	57.7	7
14-Dec-03	4.0	5	54.4	5
21-Dec-03				
28-Dec-03	0.0	2	45.4	5
4-Jan-04	2.0	1	52.3	4
11-Jan-04	16.0	6	57.1	7
18-Jan-04	33.0	7	53.0	7
25-Jan-04	73.0	6	61.3	7
1-Feb-04	16.0	5	59.0	7
8-Feb-04	0.0	7	49.0	7
15-Feb-04	24.0	7	49.1	7
22-Feb-04	16.0	5	45.6	7
29-Feb-04	22.0	7	45.6	7
7-Mar-04	7.0	6	46.9	7
14-Mar-04	3.0	7	40.9	7
21-Mar-04	28.0	7	42.3	7
28-Mar-04	7.0	7	43.9	7
4-Apr-04	0.0	7	41.9	7
11-Apr-04	3.0	7	38.7	7
18-Apr-04	5.0	7	36.9	7
25-Apr-04	0.0	7	34.0	7
2-May-04	13.0	7	31.1	7
9-May-04	4.0	6	31.6	7
16-May-04	3.0	7	29.7	7
23-May-04	74.0	7	33.7	7
30-May-04	20.0	7	40.7	7
6-Jun-04	6.0	7	38.4	7
13-Jun-04	9.0	7	35.0	7
20-Jun-04	0.0	7	30.7	7
27-Jun-04	0.0	7	28.0	7
4-Jul-04	0.0	7	25.6	7
11-Jul-04	0.0	6	22.3	7
18-Jul-04	0.0	6	19.3	7
25-Jul-04	0.0	7	16.0	7
1-Aug-04	28.0	7	14.6	7
8-Aug-04	0.0	7	15.0	7
15-Aug-04	0.0	7	11.3	7
22-Aug-04	90.0	6	18.3	7
29-Aug-04	4.0	7	19.1	7
5-Sep-04	34.0	7	17.9	7
12-Sep-04	40.0	7	22.7	7
19-Sep-04	22.0	6	31.1	7
26-Sep-04	0.0	5	30.4	5
Min	0.0		11.3	
Max	98.0		61.3	
Total	833.0			

Weekly Data Summary

Sample date	Sample time	Secchi (m)	Temp (°C)	Algae* (Shore)	Algae* (at site)	Goose Count*
	Min	0.0	0.0			
	Max	0.0	0.0			

* See introduction for discussion of algae assessment and goose count methods.

2004 Level II Data

Date (2004)	Temp (°C)	Secchi (m)	Chl-*a* (µg/l)	TP (µg/l)	TN (µg/l)	Algae Obsv.	N:P	Calculated TSI		
								Secc	chl-a	TP
25-Apr	16.0	2.8	4.17	12.9	946	3	73	45.1	44.6	41.0
10-May	16.0	2.8	2.08	13.1	842	2	64	45.1	37.8	41.3
24-May	17.0	2.5	4.49	14.2	777	3	55	46.8	45.3	42.4
7-Jun	18.0	2.8	6.73	14.7	697	3	47	45.1	49.3	42.9
22-Jun	NR	NR	1.40	10.9	650		60		33.9	38.6
6-Jul	21.5	2.7	4.33	9.6	536	2	56	45.7	44.9	36.8
19-Jul	24.5	2.7	4.49	10.8	499	2	46	45.7	45.3	38.5
2-Aug	24.0	3.0	4.17	10.2	507	2	50	44.1	44.6	37.7
16-Aug	24.5	3.4	3.20	10.8	460	2	43	42.3	42.0	38.5
30-Aug	21.0	3.4	3.04	17.8	525	2	29	42.3	41.5	45.7
13-Sep	18.5	3.3	5.87	9.6	457	2	48	42.8	47.9	36.8
26-Sep										
11-Oct	14.5	2.7	5.61	12.4	470	2	38	45.7	47.5	40.5
25-Oct	11.0	2.5	5.01	16.4	529	2	32	46.8	46.4	44.5

	Temp (°C)	Secchi (m)	Chl-*a* (µg/l)	TP (µg/l)	TN (µg/l)	Algae	N:P	Calculated TSI		
								Secc	chl-a	TP
Mean	18.9	2.9	4.2	12.6	607.3	2.3	49	44.8	43.9	40.4
Median	18.3	2.8	4.3	12.4	529.0	2	48	45.1	44.9	40.5
Min	11.0	2.5	1.4	9.6	457.0	2	29	42.3	33.9	36.8
Max	24.5	3.4	6.7	17.8	946.0	3	73	46.8	49.3	45.7
Count	12	12	13	13	13	12	13	12	13	13

TSI Average = 43.0